

### Listing of the Claims:

This listing of claims will replace all prior versions and listings of the claims in this application:

1. (Currently amended) An *in vitro* method for quantifying the osteoinductive potential of a collection of implant material comprising bone, intended for implantation into a human or non-human recipients in need thereof comprising:

(a) releasing osteogenic factors *in vitro* from a representative sampling of a collection of ~~like~~ implant materials comprising bone to produce an implant releasate containing said osteogenic factors; and

(b) quantifying the concentration of at least one osteogenic factor present in said implant releasate, wherein said at least one osteogenic factor is selected from the group consisting of a bone morphogenetic protein (BMP), a tissue growth factor (TGF), a fibroblast growth factor (FGF), a platelet derived growth factor (PDGF), a vascular endothelial growth factor (VEGF), a cartilage derived morphogenetic proteins, an insulin-like growth factor (IGF) and a combination thereof, and wherein said quantifying occurs *in vitro* and does not require implantation of said materials *in vivo* or use of a living biological entity; and

(c) converting the quantified concentration of at least one osteogenic factor to a value of osteogenic potential for said representative sampling based on a predetermined curve;

whereby the osteogenic potential of said collection is realized.

2. (Cancelled).

3. (Previously presented) The method according to claim 1, wherein said bone implant material comprises allograft, or xenograft bone, said bone being; cortical bone, cancellous bone or a combination thereof.

4. (Previously presented) The method according to claim 1, wherein said releasing of step (a) comprises demineralizing bone implant material to produce a demineralized bone implant matrix comprising a calcium concentration less than 3 percent.
5. (Original) The method according to claim 4, wherein said releasing further comprises dissolving said demineralized bone implant matrix.
6. (Original) The method according to claim 5, wherein said dissolving comprises contacting said demineralized bone implant matrix with enzymes that do not destroy osteoinductive factors present in said implant releasate, but which dissolve or otherwise dissociate said demineralized bone matrix to produce a dissolved implant releasate.
7. (Original) The method according to claim 6, wherein said enzymes comprise collagenase.
8. (Original) The method according to claim 6, wherein said method further comprises removing particulate debris from said dissolved implant releasate.
9. (Original) The method according to claim 8, wherein said removing comprises centrifuging said dissolved implant releasate and retaining the centrifugation supernatant to provide an implant releasate supernatant.
10. (Previously presented) The method according to claim 9 further comprising removing interfering non-osteogenic factor molecules from said implant releasate supernatant.
11. (Previously presented) The method according to claim 10, wherein said step of removing interfering non-osteogenic factor molecules comprises subjecting said implant releasate to dialyzing, ultrafiltering, size-exclusion fractionating, precipitating, or a combination thereof.

12. (Previously presented) The method according to claim 3, wherein said at least one osteogenic factor comprises a mitogen and a morphogen.
13. (Previously presented) The method according to claim 3, wherein said at least one osteogenic factor is a bone morphogenetic protein.
14. (Previously presented) The method according to claim 3, wherein said at least one osteogenic factor is selected from the group consisting of transforming growth factors TGF- $\alpha$ , TGF- $\beta$ , bone morphogenetic protein BMP-1, BMP-2, BMP-3, BMP-4, BMP-5, BMP-6, BMP-7, BMP-8 and a combination thereof.
15. (Original) The method according to claim 14 wherein said at least one osteogenic factor comprises TGF- $\beta$ 1 plus BMP-2 or BMP-4 or both.
16. (Previously presented) The method according to claim 1, wherein said quantifying step comprises utilizing an immunoassay which detects specific osteoinductive factors present in said implant releasate.
17. (Previously presented) The method according to claim 16, wherein said immunoassay is selected from the group consisting of enzyme-linked immunosorbent assay (ELISA), radioimmunoassay, immunoprecipitation or combinations thereof.
18. (Previously presented) The method according to claim 16 wherein said quantifying comprises contacting said at least one osteogenic factor with an antibody specific thereto such that specific binding of said antibody to said at least one osteogenic factor occurs, and quantitating the amount of said antibody specifically binding to said at least one osteogenic factor.
19. (Previously presented) The method according to claim 3, wherein said osteogenic factors are quantified in the range between picogram and milligram quantities and multiples and dilutions thereof.

20. (Previously presented) The method according to claim 3, wherein said predetermined curve is established by correlating concentrations of at least one osteogenic factor with the probability of said concentrations to generate bone *in vivo*.

21. (Original) The method according to claim 20, wherein said correlating concentrations of at least one osteogenic factor comprises correlating the product achieved by multiplying a given concentration of TGF- $\beta$ 1 with a concentration of BMP2, BMP4 or both.

22. (Previously presented) The method according to claim 3, wherein said predetermined curve is established by correlating concentration of at least one osteogenic factor with an ability to induce differentiation of undifferentiated cells.

23. (Currently amended) An *in vitro* method of measuring the osteogenic potential of an implant comprising bone, said method comprising:

- (a) releasing osteogenic factors *in vitro* from said implant to produce an implant releasate containing said osteogenic factors;
- (b) quantifying the concentration of at least one osteogenic factor in said implant releasate, wherein said at least one osteogenic factor is selected from the group consisting of a bone morphogenetic protein (BMP), a tissue growth factor (TGF), a fibroblast growth factor (FGF), a platelet derived growth factor (PDGF), a vascular endothelial growth factor (VEGF), a cartilage derived morphogenetic proteins, an insulin-like growth factor (IGF) and a combination thereof, and wherein said quantifying occurs *in vitro* and does not require implantation of said implant *in vivo* or use of a living biological entity; and
- (c) converting the quantified concentration of at least one osteogenic factor to a value of osteogenic potential for said representative sampling based on a predetermined curve;

whereby the osteogenic potential of said implant is realized.

Claims 24-30 (Cancelled).

31. (Previously presented) The method of claim 1, further comprising the step of selecting an implant from said collection having osteoinductive potential.

32-36 (Cancelled)

37. (Previously presented) The method of claim 1, wherein the total time needed to measure the osteoinductive potential of an implant is less than about four days.